

CLAIMS

1 1. A method comprising:
2 receiving at least one packet; and
3 disposing of the received at least one packet in response to a
4 walk of a Balanced Hash Table of Access Control List
5 Binary Comparison Trees, the Table encoding an Access
6 Control List.

1 2. The method of Claim 1, wherein said disposing of the
2 received at least one packet in response to a walk of a Balanced Hash
3 Table of Access Control List Binary Comparison Trees, the Table
4 encoding an Access Control List further includes:
5 constructing a hash table index value from one or more bit
6 positions, within the received at least one packet,
7 pointed at by one or more pointers of a Hash-Table-
8 Balancing Bit Selection Vector; and
9 walking a binary comparison tree associated with the
10 constructed hash table index value.

1 3. The method of Claim 1, further comprising:
2 converting the Access Control List to the Balanced Hash Table
3 of Access Control List Binary Comparison Trees, the Table
4 encoding the Access Control List.

1 4. The method of Claim 3, wherein said converting the Access
2 Control List to the Balanced Hash Table of Access Control List Binary
3 Comparison Trees, the Table encoding the Access Control List further
4 includes:
5 creating a binary comparison tree for at least one Access
6 Control List rule in the Access Control List.

1 5. The method of Claim 4, wherein said creating a binary
2 comparison tree for at least one Access Control List rule further
3 includes:
4 creating at least one node, having at least one miss branch and
5 at least one match branch, for at least one packet header
6 field utilized by the at least one Access Control List
7 Rule in the Access Control List.

1 6. The method of Claim 3, wherein said converting the Access
2 Control List to the Balanced Hash Table of Access Control List Binary
3 Comparison Trees, the Table encoding the Access Control List further
4 includes:

5 inserting at least a part of a binary comparison tree
6 constructed for at least one Access Control List rule
7 into a hash table entry pointed at by a hash table index.

1 7. The method of Claim 6, wherein said inserting at least a
2 part of a binary comparison tree constructed for at least one Access
3 Control List rule into a hash table entry pointed at by a hash table
4 index further includes:

5 generating a hash table index value for the at least one Access
6 Control List rule; and

7 inserting the at least a part of a binary comparison tree
8 constructed for at least one Access Control List rule
9 into a hash table entry pointed at by a hash table index
10 which is equal to the generated hash table index value.

1 8. The method of Claim 7, wherein said inserting the at
2 least a part of a binary comparison tree constructed for at least one
3 Access Control List rule into a hash table entry pointed at by a hash
4 table index which is equal to the generated hash table index value
5 further includes:

6 inserting, in its entirety, the binary comparison tree
7 constructed for the at least one Access Control List rule
8 into the hash table entry pointed at by the hash table
9 index in response to a determination that no pre-existing
10 binary comparison tree is resident within the hash table
11 entry.

1 9. The method of Claim 7, wherein said inserting the at
2 least a part of a binary comparison tree constructed for at least one
3 Access Control List rule into a hash table entry pointed at by a hash
4 table index which is equal to the generated hash table index value
5 further includes:

6 inserting at least one node of the binary comparison tree
7 constructed for the at least one Access Control List rule
8 into the hash table entry pointed at by the hash table
9 index in response to a determination that a pre-existing
10 binary comparison tree is resident within the hash table
11 entry.

1 10. The method of Claim 7, wherein said generating a hash
2 table index value for the at least one Access Control List rule
3 further includes:

4 constructing the hash table index value from the contents of
5 one or more packet headers utilized by the at least one
6 Access Control List rule in the Access Control List.

1 11. The method of Claim 10, wherein said constructing the
2 hash table index value from the contents of one or more packet
3 headers utilized by the at least one Access Control List rule in the
4 Access Control List further includes:

5 constructing the hash table index value from the contents of
6 the one or more packet header bit positions pointed at by
7 one or more pointers of a Hash-Table-Balancing Bit
8 Selection Vector.

1 12. The method of Claim 11, wherein said constructing the
2 hash table index value from the contents of the one or more packet
3 header bit positions pointed at by one or more pointers of a Hash-
4 Table-Balancing Bit Selection Vector further includes:

5 constructing the Hash-Table-Balancing Bit Selection Vector.

1 13. The method of Claim 12, wherein said constructing the
2 Hash-Table-Balancing Bit Selection Vector further includes:

3 defining one or more pointers of the Hash-Table-Balancing Bit
4 Selection Vector to point to one or more bit positions in
5 one or more packet header fields utilized by one or more
6 rules of the Access Control List.

1 14. The method of Claim 13, wherein said defining one or more
2 pointers of the Hash-Table-Balancing Bit Selection Vector to point to
3 one or more bit positions in one or more packet header fields
4 utilized by one or more rules of the Access Control List further
5 includes:

6 defining the one or more pointers of the Hash-Table-Balancing
7 Bit Selection Vector to point to one or more bit
8 positions, which appear relatively most frequently,
9 within the one or more packet header fields utilized by
10 the one or more Rules of the Access Control List.

1 15. The method of Claim 13, wherein said defining one or more
2 pointers of the Hash-Table-Balancing Bit Selection Vector to point to
3 one or more bit positions in one or more packet header fields
4 utilized by one or more rules of the Access Control List further
5 includes:
6 defining the one or more pointers of the Hash-Table-Balancing
7 Bit Selection Vector to point to one or more bit
8 positions, whose contents have relatively equal variation
9 between logical one and logical zero, within the one or
10 more packet header fields utilized by the one or more
11 Rules of the Access Control List.

1 16. A system comprising:
2 means for receiving at least one packet; and
3 means for disposing of the received at least one packet in
4 response to a walk of a Balanced Hash Table of Access
5 Control List Binary Comparison Trees, the Table encoding
6 an Access Control List.

1 17. The system of Claim 16, wherein said means for disposing
2 of the received at least one packet in response to a walk of a
3 Balanced Hash Table of Access Control List Binary Comparison Trees,
4 the Table encoding an Access Control List further includes:

5 means for constructing a hash table index value from one or
6 more bit positions, within the received at least one
7 packet, pointed at by one or more pointers of a Hash-
8 Table-Balancing Bit Selection Vector; and
9 means for walking a binary comparison tree associated with the
10 constructed hash table index value.

1 18. The system of Claim 16, further comprising:
2 means for converting the Access Control List to the Balanced
3 Hash Table of Access Control List Binary Comparison
4 Trees, the Table encoding the Access Control List.

1 19. The system of Claim 18, wherein said means for converting
2 the Access Control List to the Balanced Hash Table of Access Control
3 List Binary Comparison Trees, the Table encoding the Access Control
4 List further includes:

5 means for creating a binary comparison tree for at least one
6 Access Control List rule in the Access Control List.

1 20. The system of Claim 19, wherein said means for creating a
2 binary comparison tree for at least one Access Control List rule
3 further includes:

4 means for creating at least one node, having at least one miss
5 branch and at least one match branch, for at least one
6 packet header field utilized by the at least one Access
7 Control List rule in the Access Control List.

1 21. The system of Claim 18, wherein said means for converting
2 the Access Control List to the Balanced Hash Table of Access Control
3 List Binary Comparison Trees, the Table encoding the Access Control
4 List further includes:

5 means for inserting at least a part of a binary comparison tree
6 constructed for at least one Access Control List rule
7 into a hash table entry pointed at by a hash table index.

1 22. The system of Claim 21, wherein said means for inserting
2 at least a part of a binary comparison tree constructed for at least
3 one Access Control List rule into a hash table entry pointed at by a
4 hash table index further includes:

5 means for generating a hash table index value for the at least
6 one Access Control List rule; and

7 means for inserting the at least a part of a binary comparison
8 tree constructed for at least one Access Control List
9 rule into a hash table entry pointed at by a hash table
10 index which is equal to the generated hash table index
11 value.

1 23. The system of Claim 22, wherein said means for inserting
2 the at least a part of a binary comparison tree constructed for at
3 least one Access Control List rule into a hash table entry pointed at
4 by a hash table index which is equal to the generated hash table
5 index value further includes:

6 means for inserting, in its entirety, the binary comparison
7 tree constructed for the at least one Access Control List
8 Rule into the hash table entry pointed at by the hash
9 table index in response to a determination that no pre-
10 existing binary comparison tree is resident within the
11 hash table entry.

1 24. The system of Claim 22, wherein said means for inserting
2 the at least a part of a binary comparison tree constructed for at
3 least one Access Control List rule into a hash table entry pointed at
4 by a hash table index which is equal to the generated hash table
5 index value further includes:

6 means for inserting at least one node of the binary comparison
7 tree constructed for the at least one Access Control List
8 rule into the hash table entry pointed at by the hash
9 table index in response to a determination that a pre-

10 existing binary comparison tree is resident within the
11 hash table entry.

1 25. The system of Claim 22, wherein said means for generating
2 a hash table index value for the at least one Access Control List
3 rule further includes:
4 means for constructing the hash table index value from the
5 contents of one or more packet headers utilized by the at
6 least one Access Control List rule in the Access Control
7 List.

1 26. The system of Claim 25, wherein said means for
2 constructing the hash table index value from the contents of one or
3 more packet headers utilized by the at least one Access Control List
4 rule in the Access Control List further includes:
5 means for constructing the hash table index value from the
6 contents of the one or more packet header bit positions
7 pointed at by one or more pointers of a Hash-Table-
8 Balancing Bit Selection Vector.

1 27. The system of Claim 26, wherein said means for
2 constructing the hash table index value from the contents of the one
3 or more packet header bit positions pointed at by one or more
4 pointers of a Hash-Table-Balancing Bit Selection Vector further
5 includes:
6 means for constructing the Hash-Table-Balancing Bit Selection
7 Vector.

1 28. The system of Claim 27, wherein said means for
2 constructing the Hash-Table-Balancing Bit Selection Vector further
3 includes:
4 means for defining one or more pointers of the Hash-Table-
5 Balancing Bit Selection Vector to point to one or more
6 bit positions in one or more packet header fields
7 utilized by one or more rules of the Access Control List.

1 29. The system of Claim 28, wherein said means for defining
2 one or more pointers of the Hash-Table-Balancing Bit Selection Vector
3 to point to one or more bit positions in one or more packet header
4 fields utilized by one or more rules of the Access Control List
5 further includes:

6 means for defining the one or more pointers of the Hash-Table-
7 Balancing Bit Selection Vector to point to one or more
8 bit positions, which appear relatively most frequently,
9 within the one or more packet header fields utilized by
10 the one or more Rules of the Access Control List.

1 30. The system of Claim 29, wherein said means for defining
2 one or more pointers of the Hash-Table-Balancing Bit Selection Vector
3 to point to one or more bit positions in one or more packet header
4 fields utilized by one or more rules of the Access Control List
5 further includes:

6 means for defining the one or more pointers of the Hash-Table-
7 Balancing Bit Selection Vector to point to one or more
8 bit positions, whose contents have relatively equal
9 variation between logical one and logical zero, within
10 the one or more packet header fields utilized by the one
11 or more Rules of the Access Control List.

1 31. The system of Claim 16, further comprising:
2 signal bearing media bearing
3 said means for receiving at least one packet, and
4 said means for disposing of the received at least one
5 packet in response to a walk of a Balanced Hash
6 Table of Access Control List Binary Comparison
7 Trees, the Table encoding an Access Control List.

1 32. The system of Claim 31, wherein said signal bearing media
2 further includes:
3 recordable media.

1 33. The system of Claim 31, wherein said signal bearing media
2 further includes:
3 transmission media.

1 34. The system of Claim 16, wherein the system further
2 includes:
3 a network station.

1 35. A program product comprising:
2 signal bearing media bearing
3 means for receiving at least one packet, and
4 means for disposing of the received at least one packet
5 in response to a walk of a Balanced Hash Table of
6 Access Control List Binary Comparison Trees, the
7 Table encoding an Access Control List.

1 36. The program product of Claim 35, wherein said signal
2 bearing media further includes:
3 recordable media.

1 37. The program product of Claim 35, wherein said signal
2 bearing media further includes:
3 transmission media.

1 38. The program product of Claim 35, wherein said means for
2 disposing of the received at least one packet in response to a walk
3 of a Balanced Hash Table of Access Control List Binary Comparison
4 Trees, the Table encoding an Access Control List further includes:
5 means for constructing a hash table index value from one or
6 more bit positions, within the received at least one
7 packet, pointed at by one or more pointers of a Hash-
8 Table-Balancing Bit Selection Vector; and
9 means for walking a binary comparison tree associated with the
10 constructed hash table index value.

1 39. The program product of Claim 35, further comprising:
2 means for converting the Access Control List to the Balanced
3 Hash Table of Access Control List Binary Comparison
4 Trees, the Table encoding the Access Control List.

1 40. The program product of Claim 39, wherein said means for
2 converting the Access Control List to the Balanced Hash Table of
3 Access Control List Binary Comparison Trees, the Table encoding the
4 Access Control List further includes:
5 means for creating a binary comparison tree for at least one
6 Access Control List rule in the Access Control List.

1 41. The program product of Claim 40, wherein said means for
2 creating a binary comparison tree for at least one Access Control
3 List rule further includes:

4 means for creating at least one node, having at least one miss
5 branch and at least one match branch, for at least one
6 packet header field utilized by the at least one Access
7 Control List rule in the Access Control List.

1 42. The program product of Claim 39, wherein said means for
2 converting the Access Control List to the Balanced Hash Table of
3 Access Control List Binary Comparison Trees, the Table encoding the
4 Access Control List further includes:

5 means for inserting at least a part of a binary comparison tree
6 constructed for at least one Access Control List rule
7 into a hash table entry pointed at by a hash table index.

1 43. The program product of Claim 42, wherein said means for
2 inserting at least a part of a binary comparison tree constructed for
3 at least one Access Control List rule into a hash table entry pointed
4 at by a hash table index further includes:

5 means for generating a hash table index value for the at least
6 one Access Control List rule; and

7 means for inserting the at least a part of a binary comparison
8 tree constructed for at least one Access Control List
9 rule into a hash table entry pointed at by a hash table
10 index which is equal to the generated hash table index
11 value.

1 44. The program product of Claim 43, wherein said means for
2 inserting the at least a part of a binary comparison tree constructed
3 for at least one Access Control List rule into a hash table entry
4 pointed at by a hash table index which is equal to the generated hash
5 table index value further includes:

6 means for inserting, in its entirety, the binary comparison
7 tree constructed for the at least one Access Control List
8 Rule into the hash table entry pointed at by the hash
9 table index in response to a determination that no pre-
10 existing binary comparison tree is resident within the
11 hash table entry.

1 45. The program product of Claim 43, wherein said means for
2 inserting the at least a part of a binary comparison tree constructed
3 for at least one Access Control List rule into a hash table entry
4 pointed at by a hash table index which is equal to the generated hash
5 table index value further includes:
6 means for inserting at least one node of the binary comparison
7 tree constructed for the at least one Access Control List
8 rule into the hash table entry pointed at by the hash
9 table index in response to a determination that a pre-
10 existing binary comparison tree is resident within the
11 hash table entry.

1 46. The program product of Claim 43, wherein said means for
2 generating a hash table index value for the at least one Access
3 Control List rule further includes:
4 means for constructing the hash table index value from the
5 contents of one or more packet headers utilized by the at
6 least one Access Control List rule in the Access Control
7 List.

1 47. The program product of Claim 46, wherein said means for
2 constructing the hash table index value from the contents of one or
3 more packet headers utilized by the at least one Access Control List
4 rule in the Access Control List further includes:
5 means for constructing the hash table index value from the
6 contents of the one or more packet header bit positions
7 pointed at by one or more pointers of a Hash-Table-
8 Balancing Bit Selection Vector.

1 48. The program product of Claim 47, wherein said means for
2 constructing the hash table index value from the contents of the one
3 or more packet header bit positions pointed at by one or more
4 pointers of a Hash-Table-Balancing Bit Selection Vector further
5 includes:
6 means for constructing the Hash-Table-Balancing Bit Selection
7 Vector.

1 49. The program product of Claim 48, wherein said means for
2 constructing the Hash-Table-Balancing Bit Selection Vector further
3 includes:

4 means for defining one or more pointers of the Hash-Table-
5 Balancing Bit Selection Vector to point to one or more
6 bit positions in one or more packet header fields
7 utilized by one or more rules of the Access Control List.

1 50. The program product of Claim 49, wherein said means for
2 defining one or more pointers of the Hash-Table-Balancing Bit
3 Selection Vector to point to one or more bit positions in one or more
4 packet header fields utilized by one or more rules of the Access
5 Control List further includes:
6 means for defining the one or more pointers of the Hash-Table-
7 Balancing Bit Selection Vector to point to one or more
8 bit positions, which appear relatively most frequently,
9 within the one or more packet header fields utilized by
10 the one or more Rules of the Access Control List.

1 51. The program product of Claim 50, wherein said means for
2 defining one or more pointers of the Hash-Table-Balancing Bit
3 Selection Vector to point to one or more bit positions in one or more
4 packet header fields utilized by one or more rules of the Access
5 Control List further includes:
6 means for defining the one or more pointers of the Hash-Table-
7 Balancing Bit Selection Vector to point to one or more
8 bit positions, whose contents have relatively equal
9 variation between logical one and logical zero, within
10 the one or more packet header fields utilized by the one
11 or more Rules of the Access Control List.

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